

# Climate Change Impacts on Wildfire

March 17, 2009

Climate Change Symposium  
Tahoe, CA

A. Westerling – UC Merced

B. Bryant – RAND

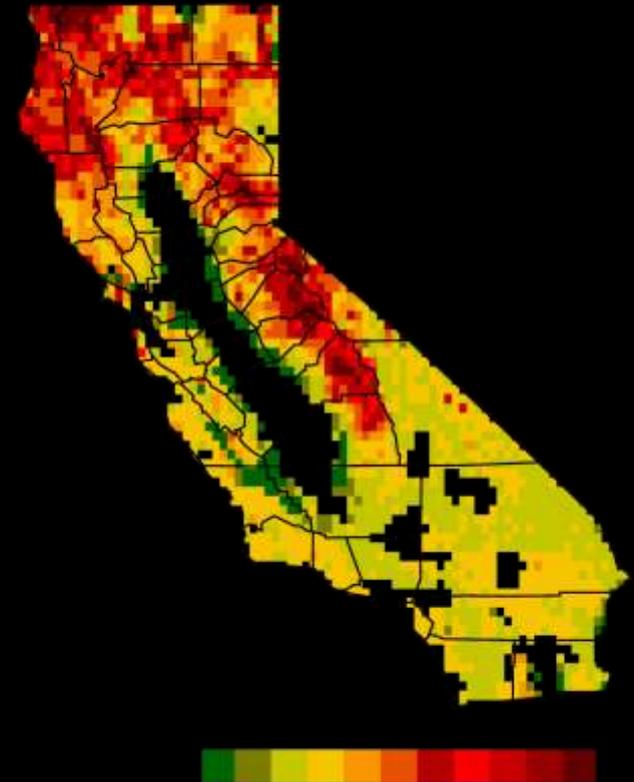
H. Preisler – USFS

H. Hidalgo & T. Das – SIO

S. Shrestha – UC Merced

California Energy Commission

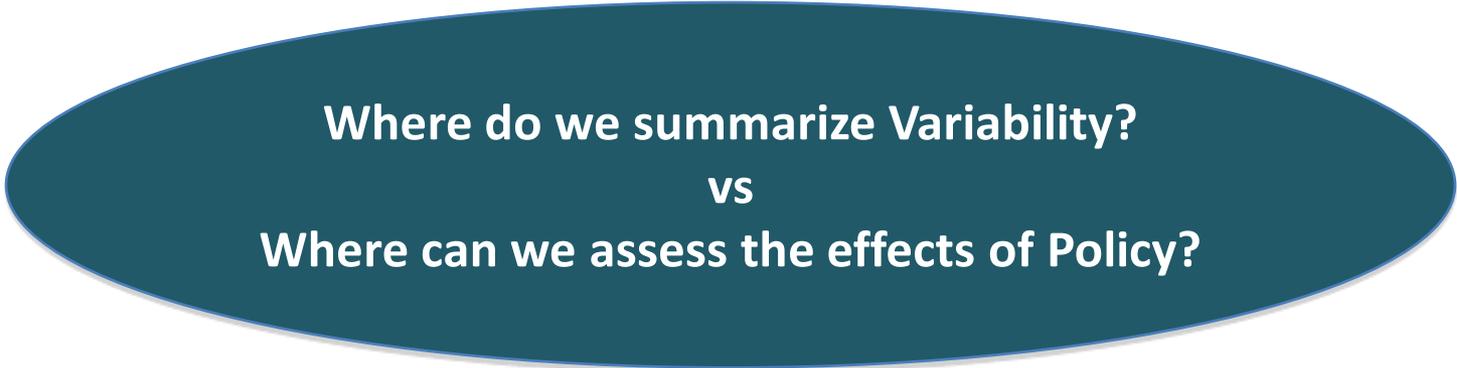
NOAA OGP ★ USDA Forest Service



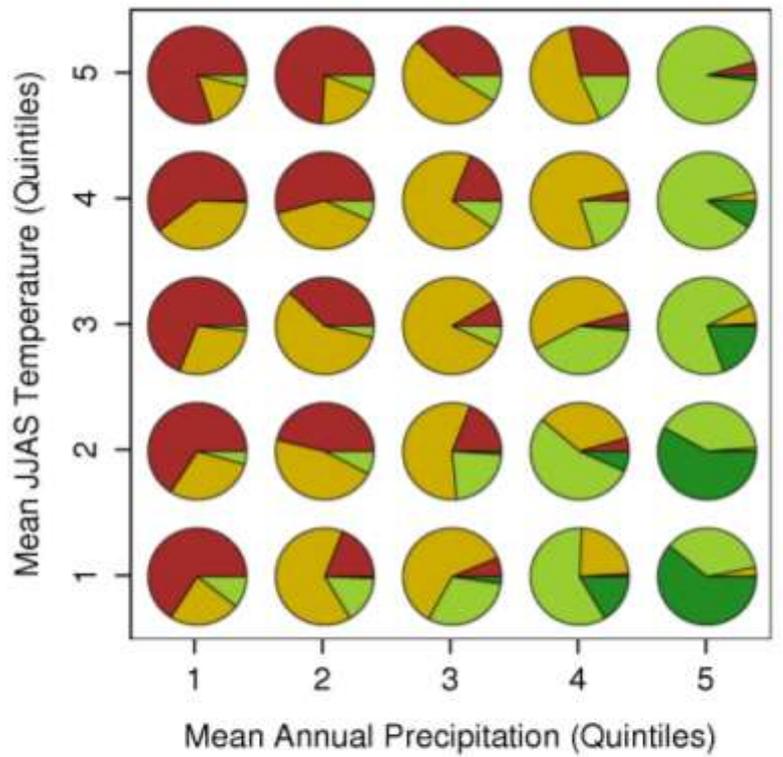
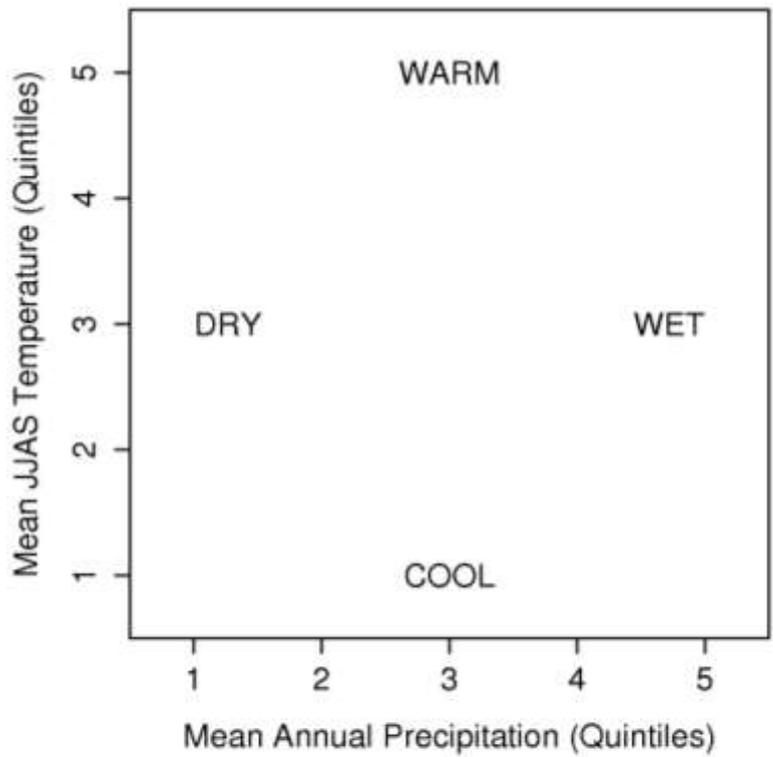
**Emissions  
Scenarios**

sresA2

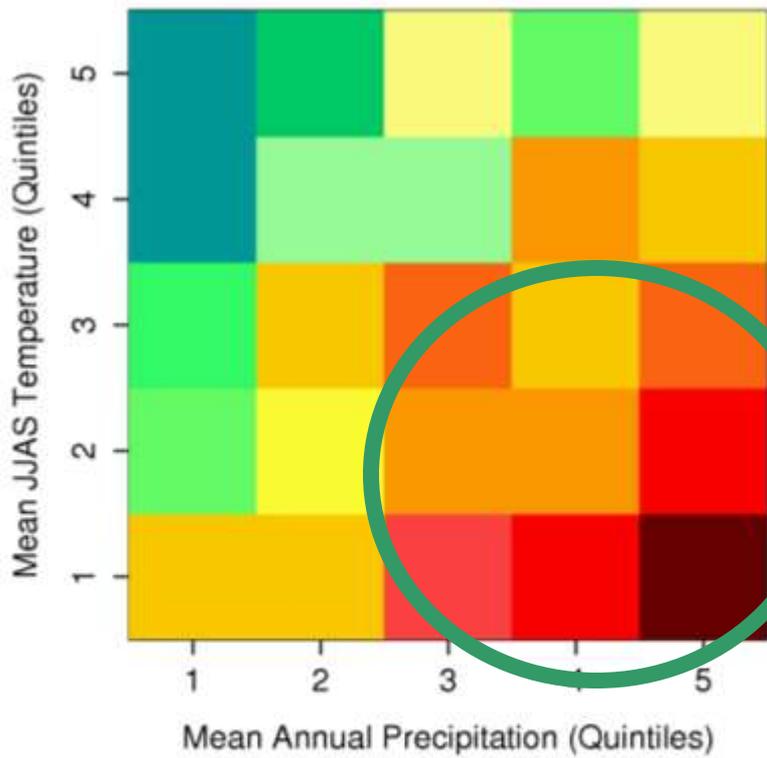
sresB1



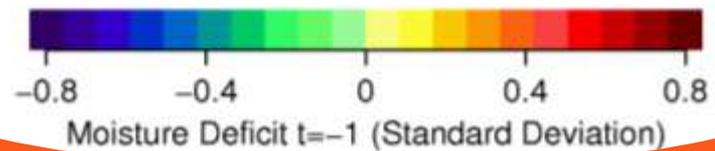
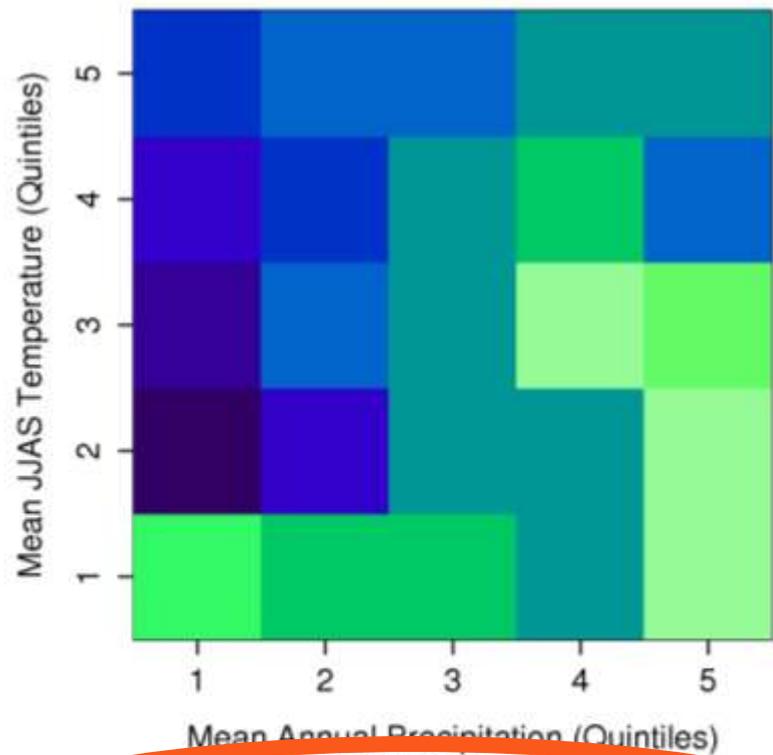
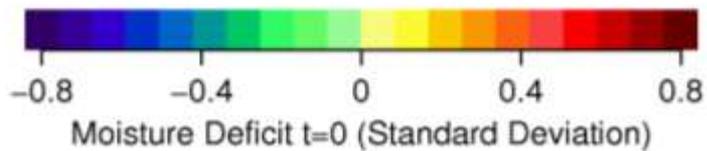
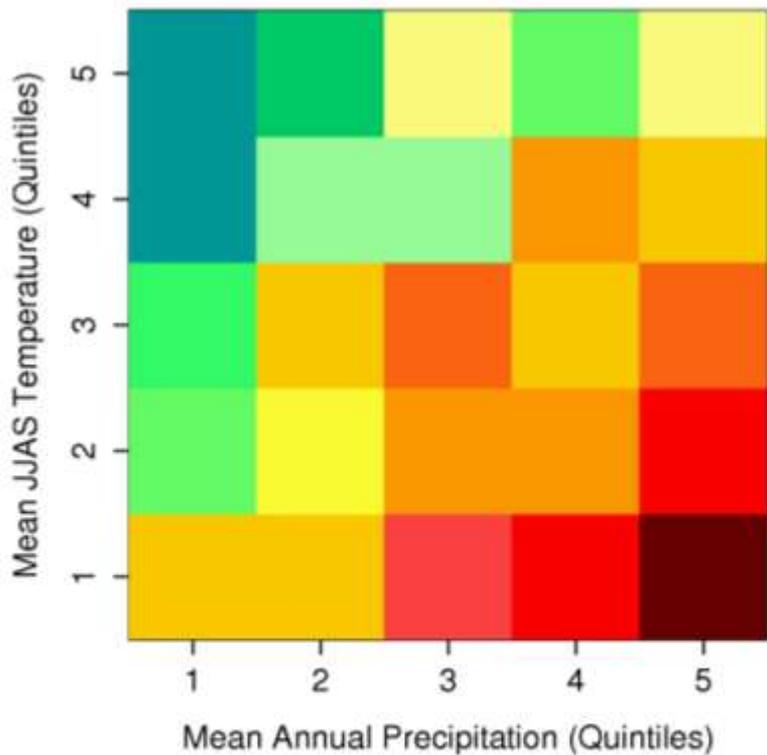
<b>Climate Models</b>	<b>Downscaling Methods</b>	<b>Hydrologic Modeling</b>	<b>Fire &amp; Veg Change</b>	<b>Development Scenarios</b>
cnrmcm3	Analog	VIC simulation	statistical modeling	Lo/mid/hi Population growth
gfdlcm21	BCSD			Clustering/footprint
microc32med				
mpiecham5				<b>Impacts</b>
ncarccsm3				Property Losses Suppression Costs
ncarpcm1				Ecosystem Services



- Shrub
- Grass
- Woodland
- Forest

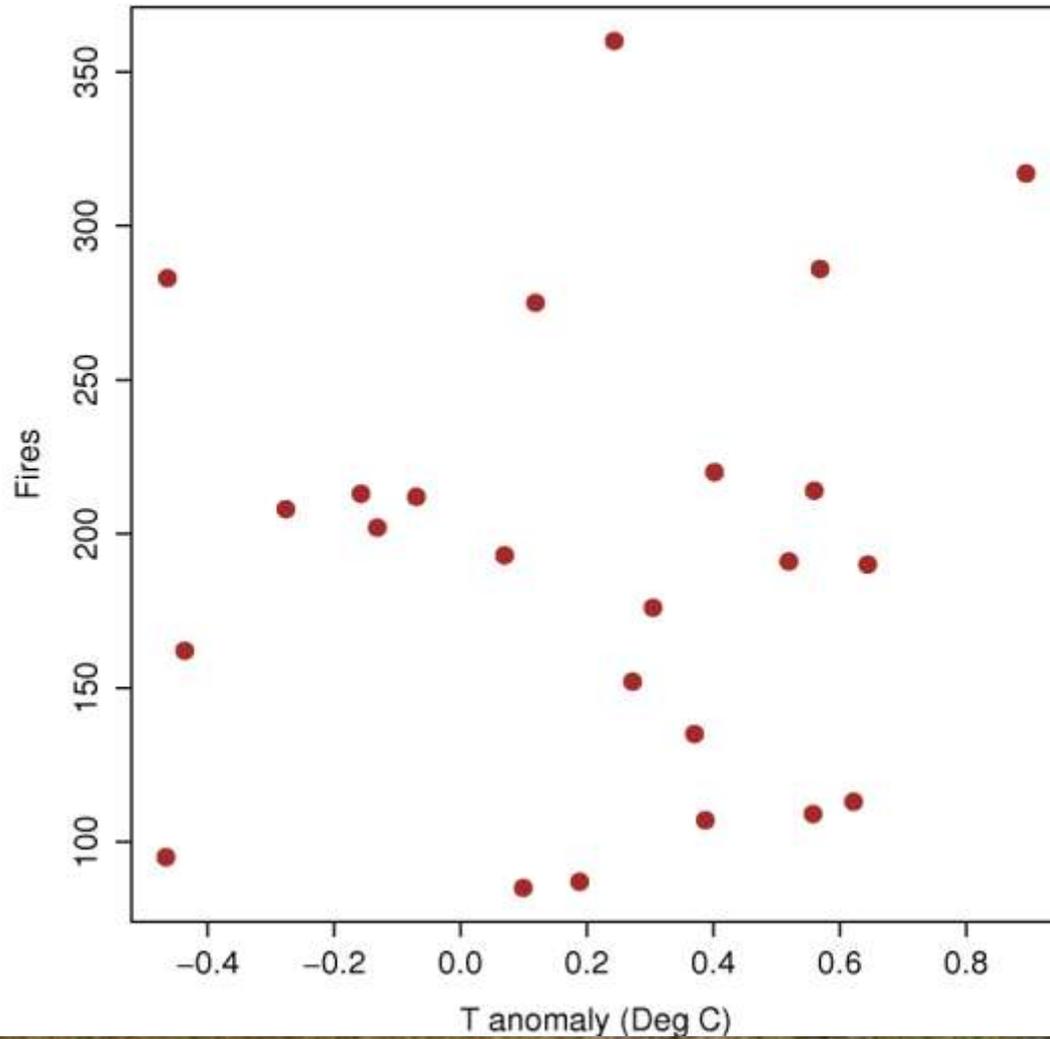


Cool, Wet Forests  
Burn in Dry Years



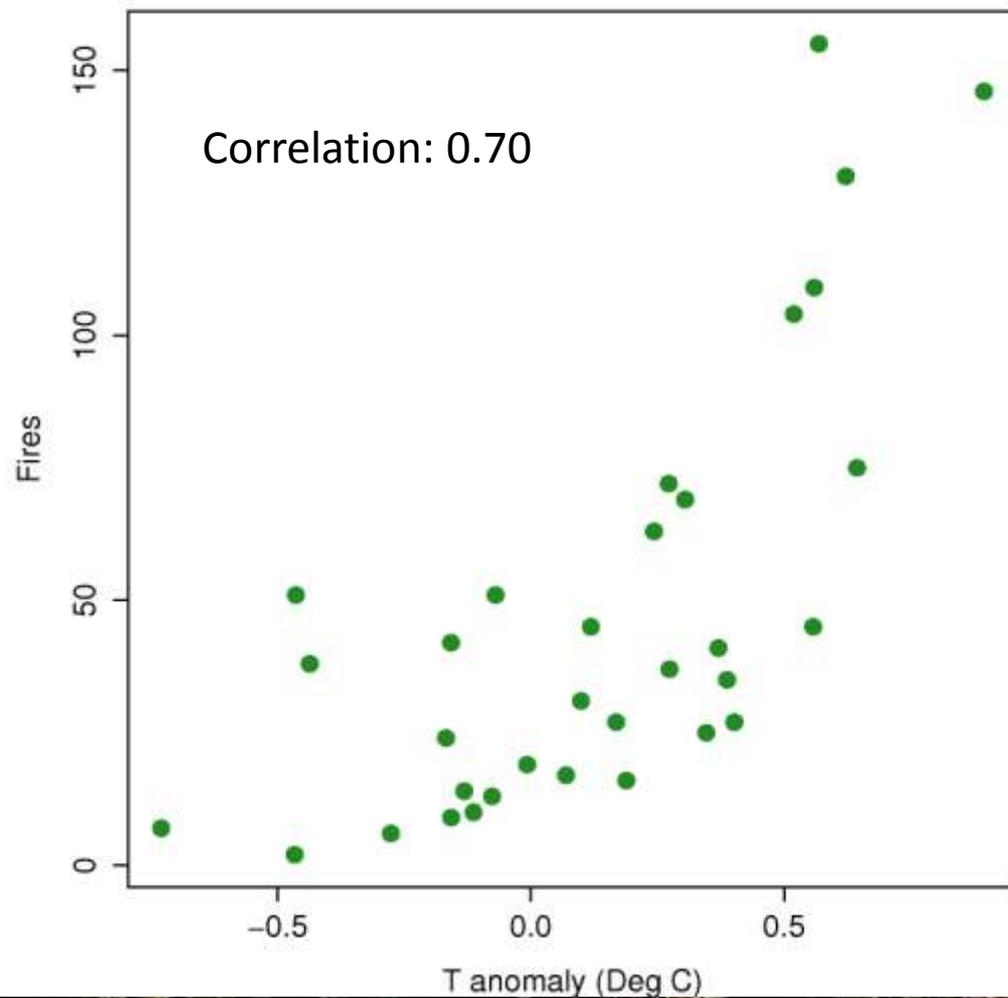
Was the year before the fire burned wet or dry?

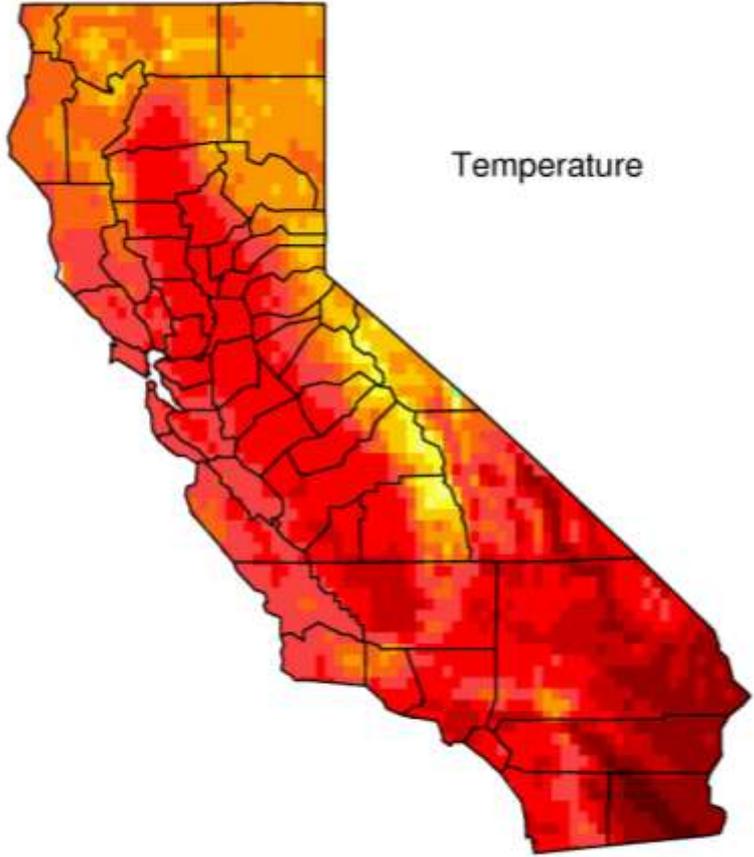
## Grass/Shrub Fires and Temperature



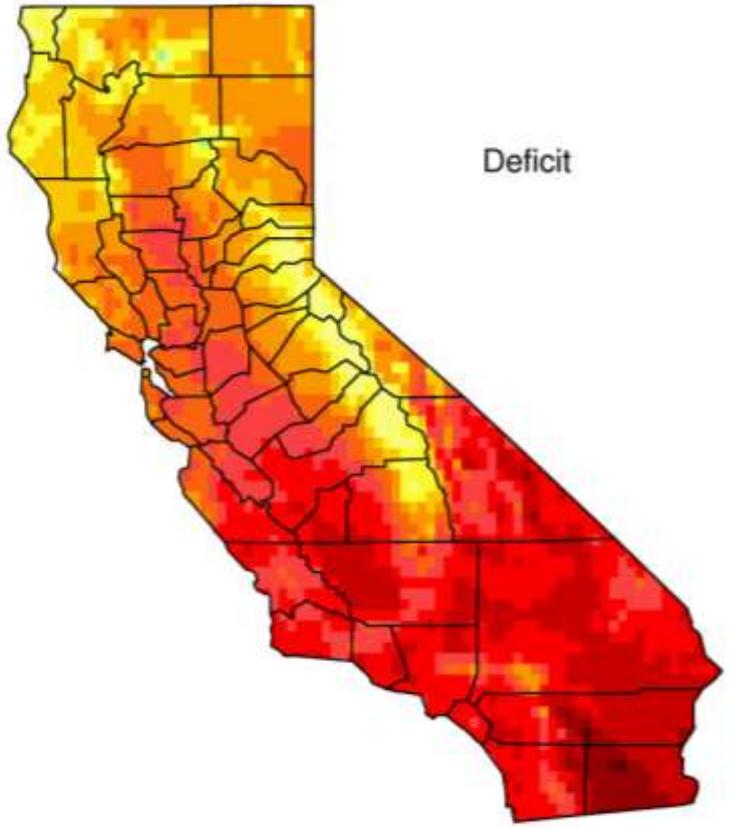
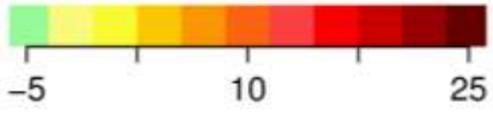
Correlation: 0.08

## Forest Fires & Temperature

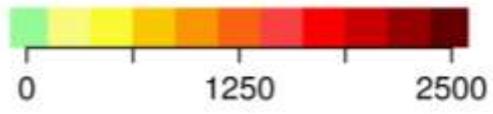


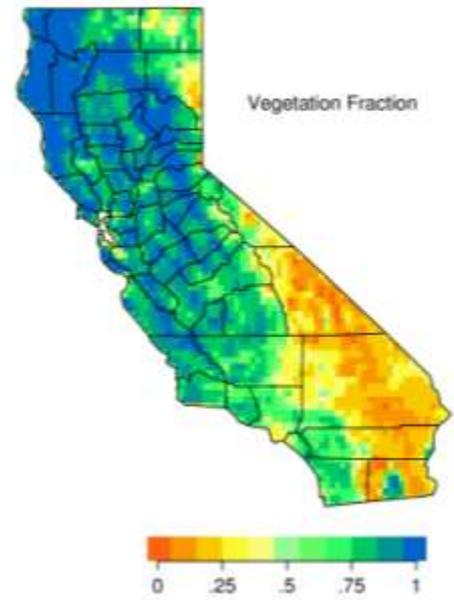
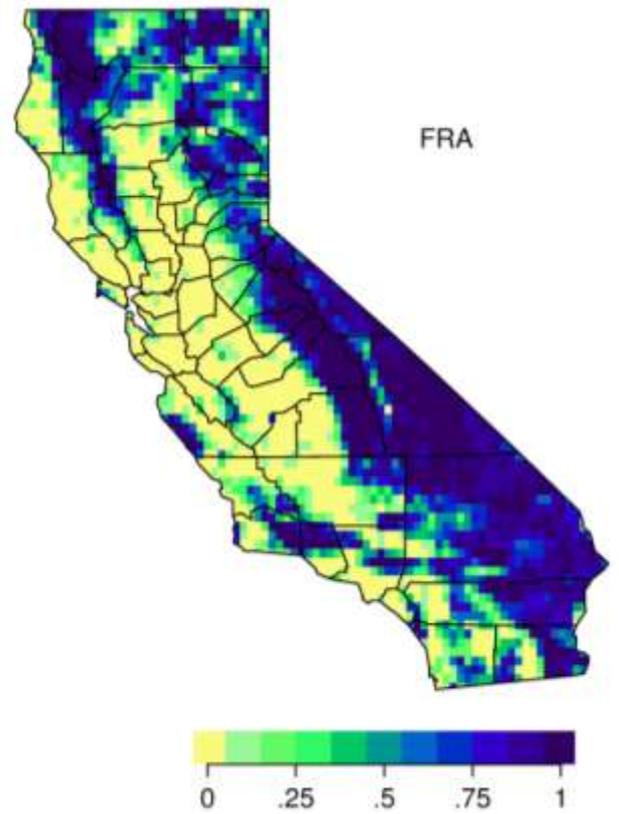
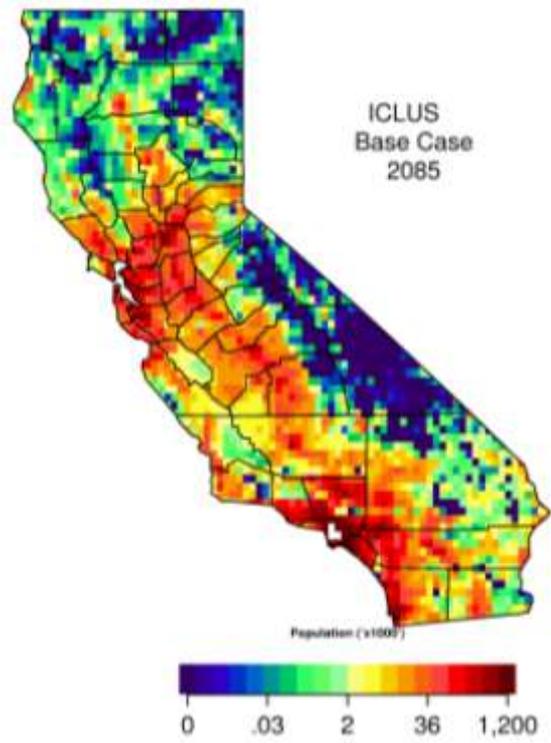
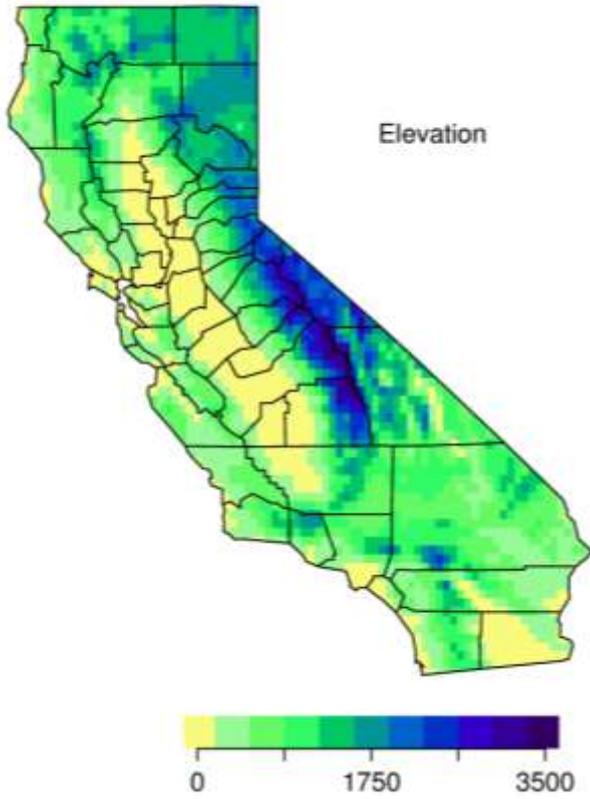


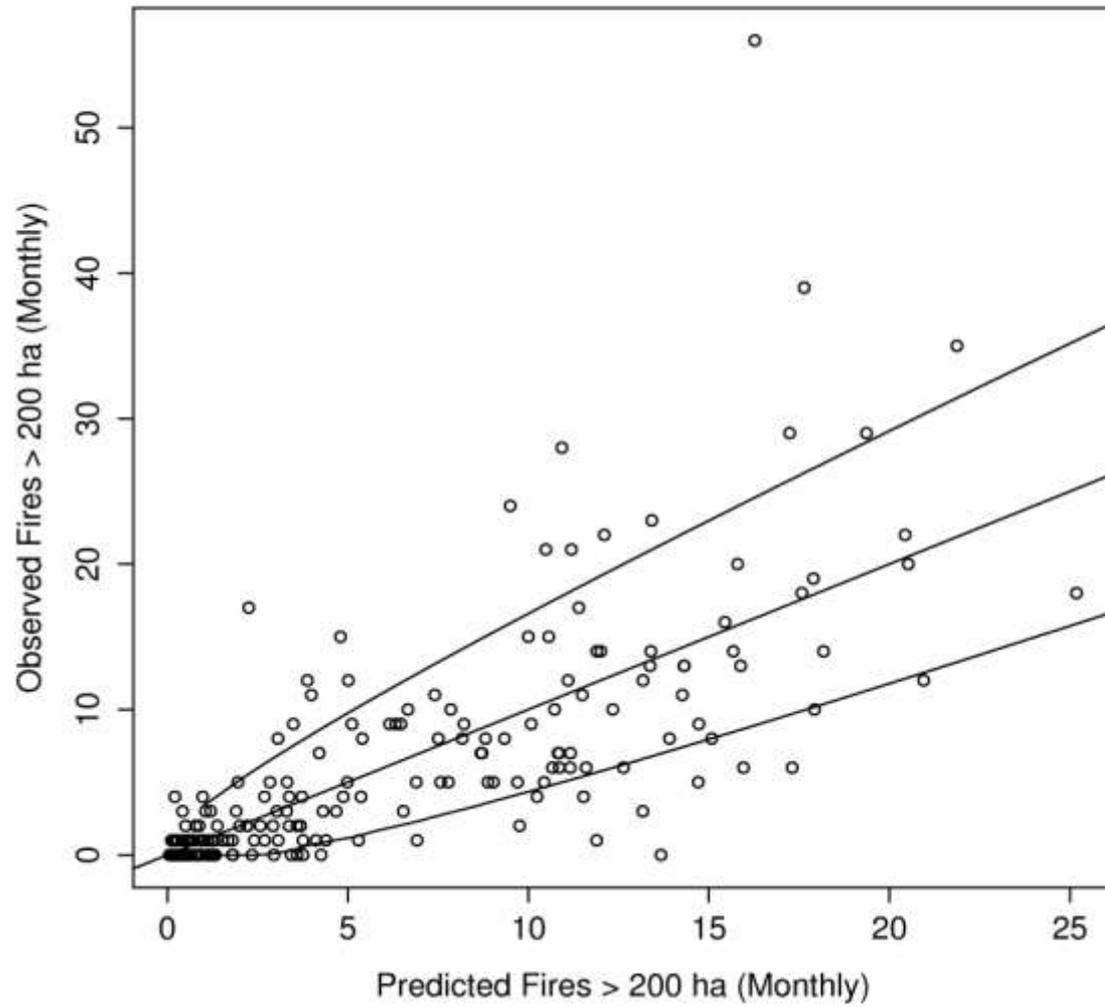
Temperature



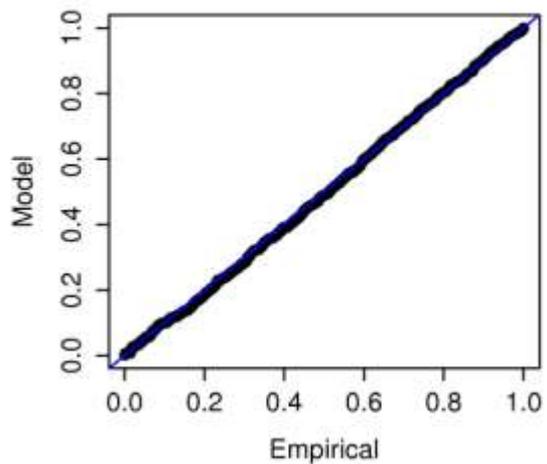
Deficit



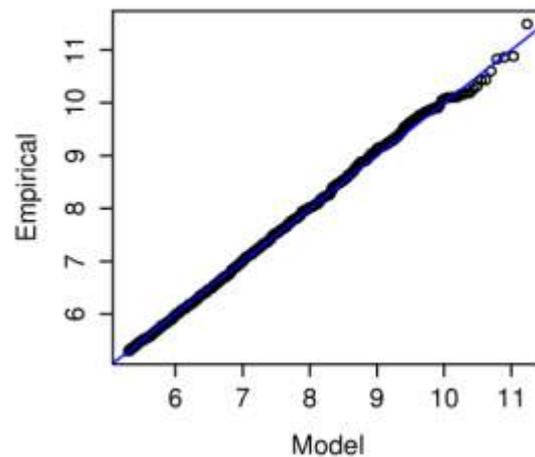




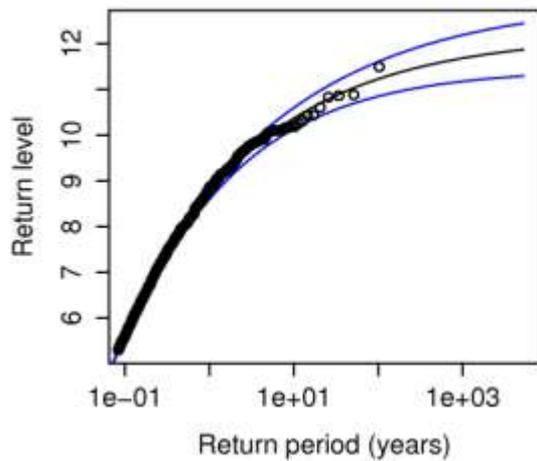
**Probability Plot**



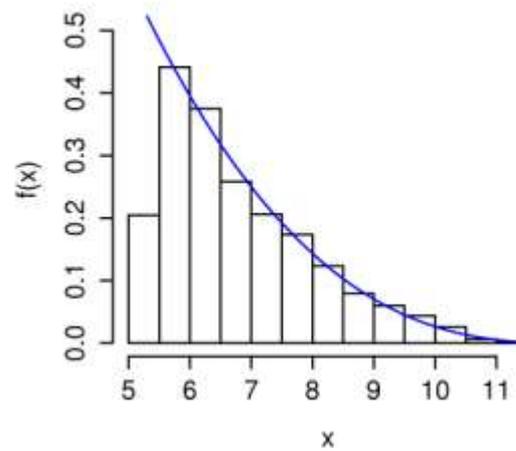
**Quantile Plot**



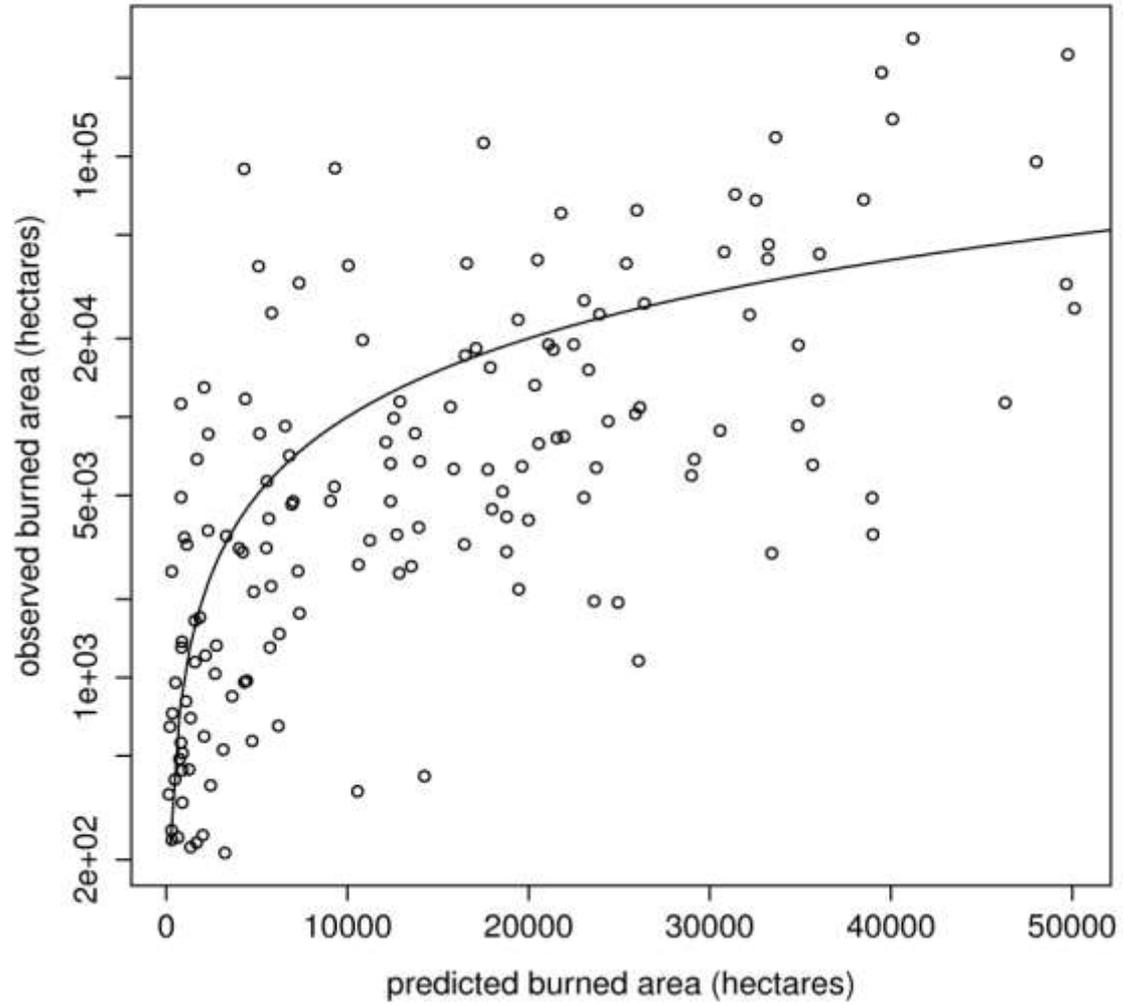
**Return Level Plot**



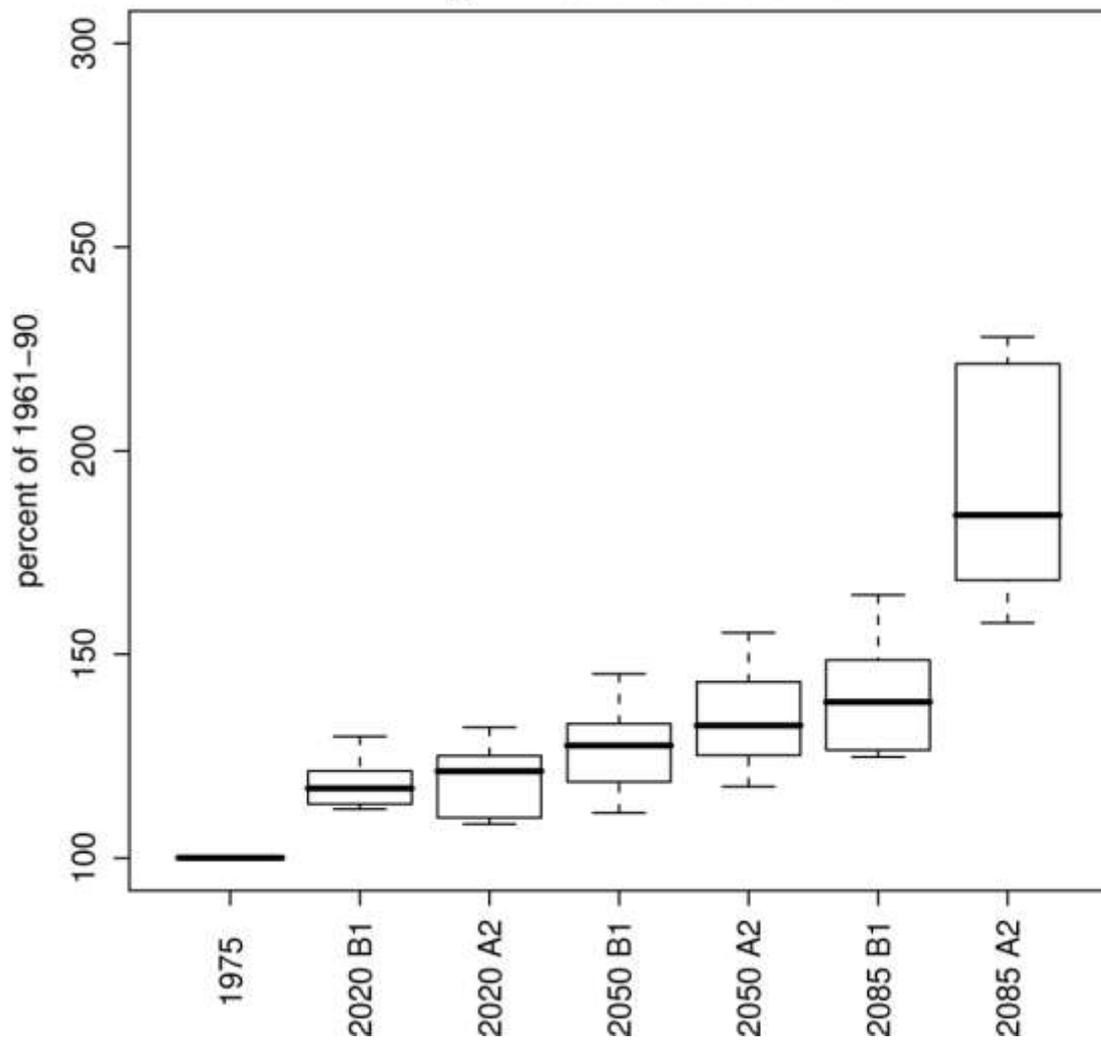
**Density Plot**



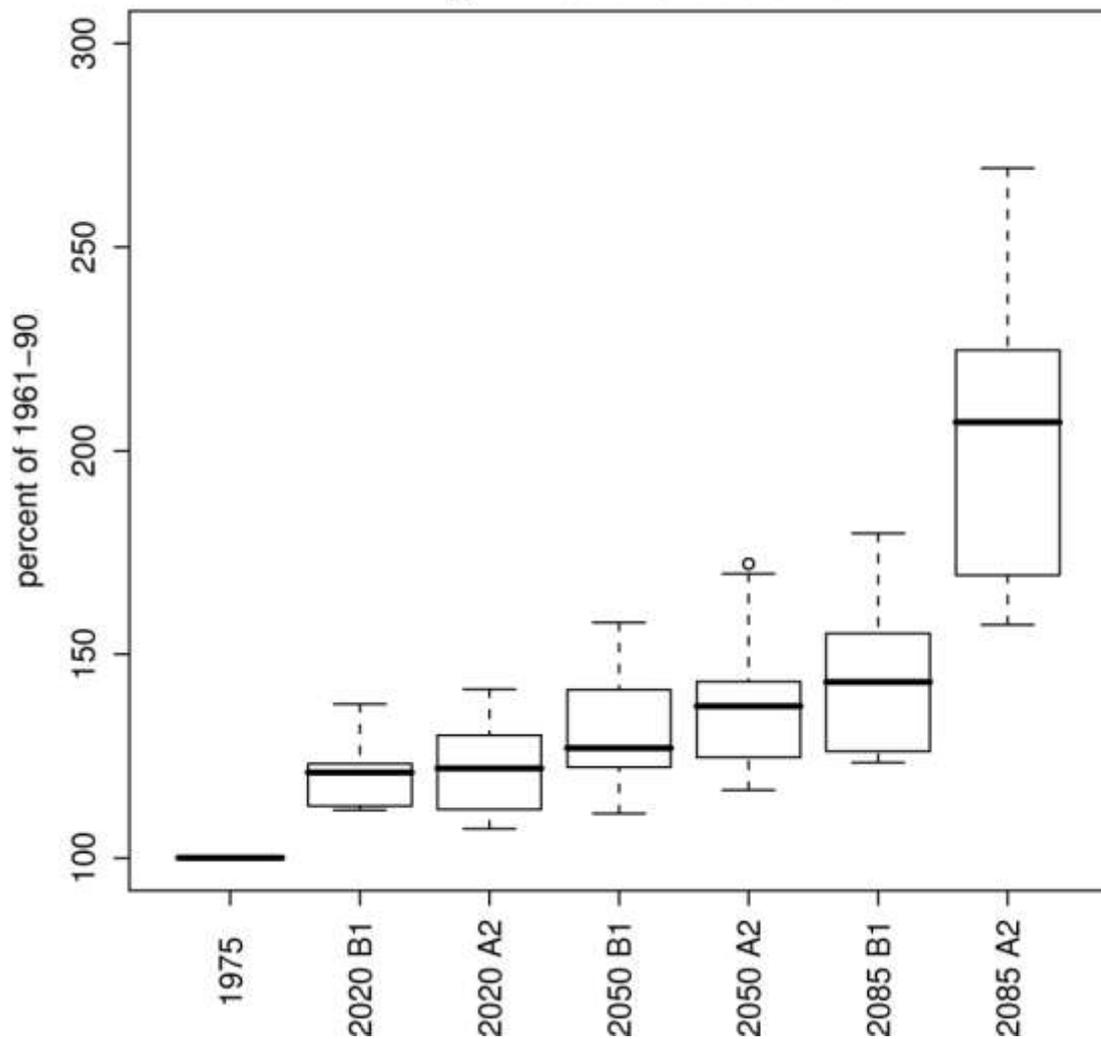
California Monthly Burned Area

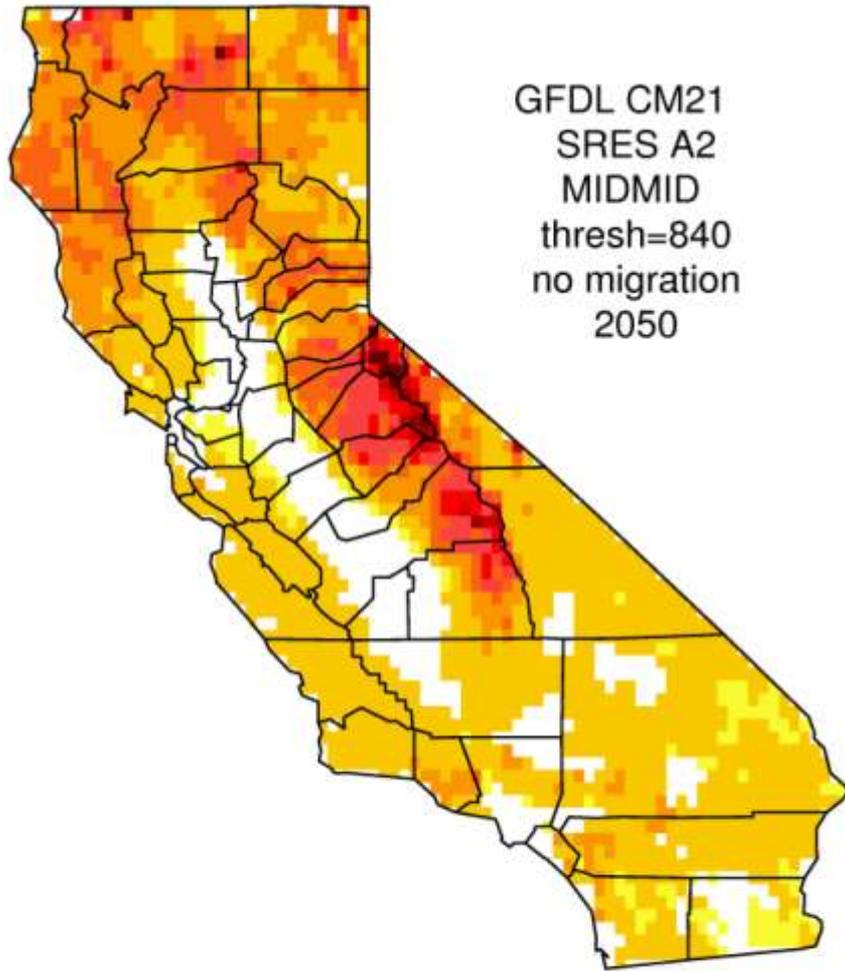


### Change in Mean Expected Fires >200 ha by Emissions Scenario

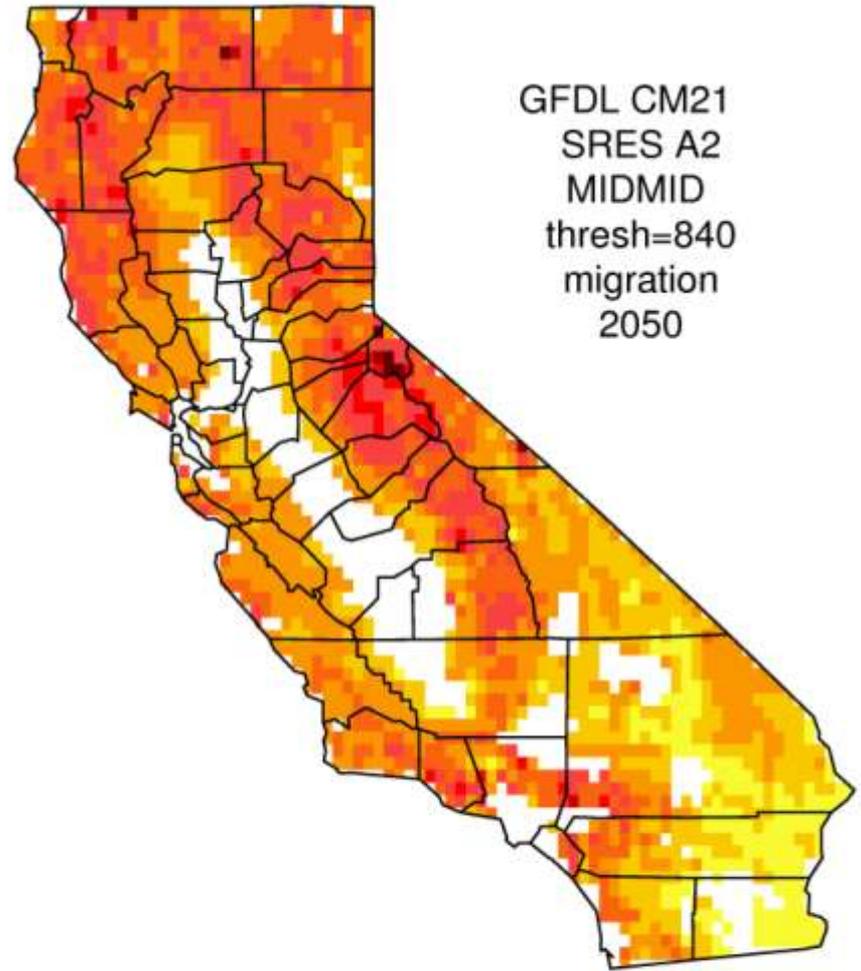
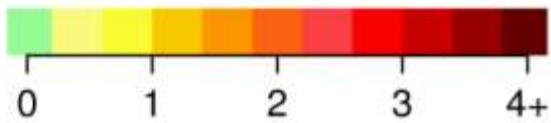


**Change in Mean Expected Burned Area  
by Emissions Scenario**

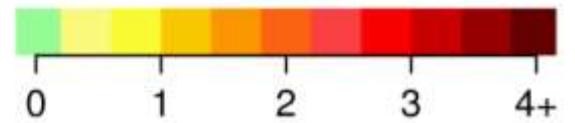


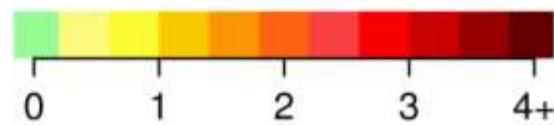
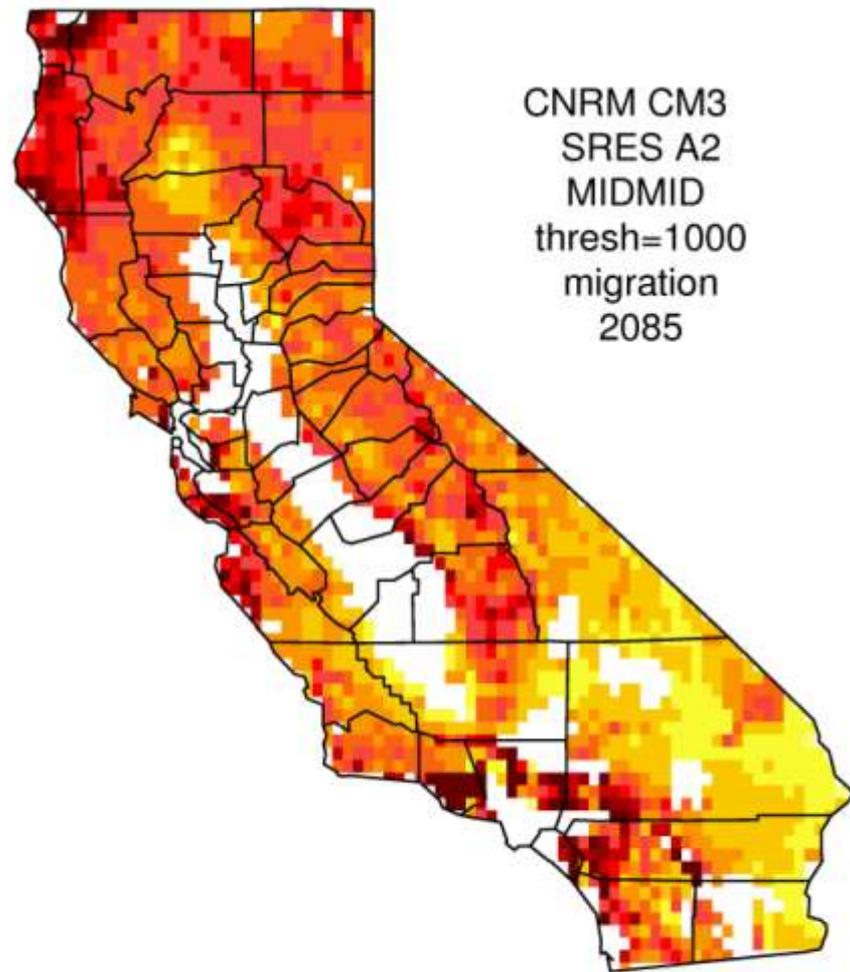
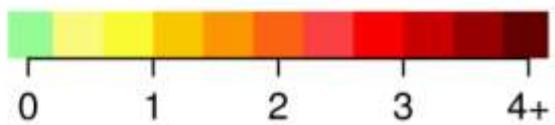
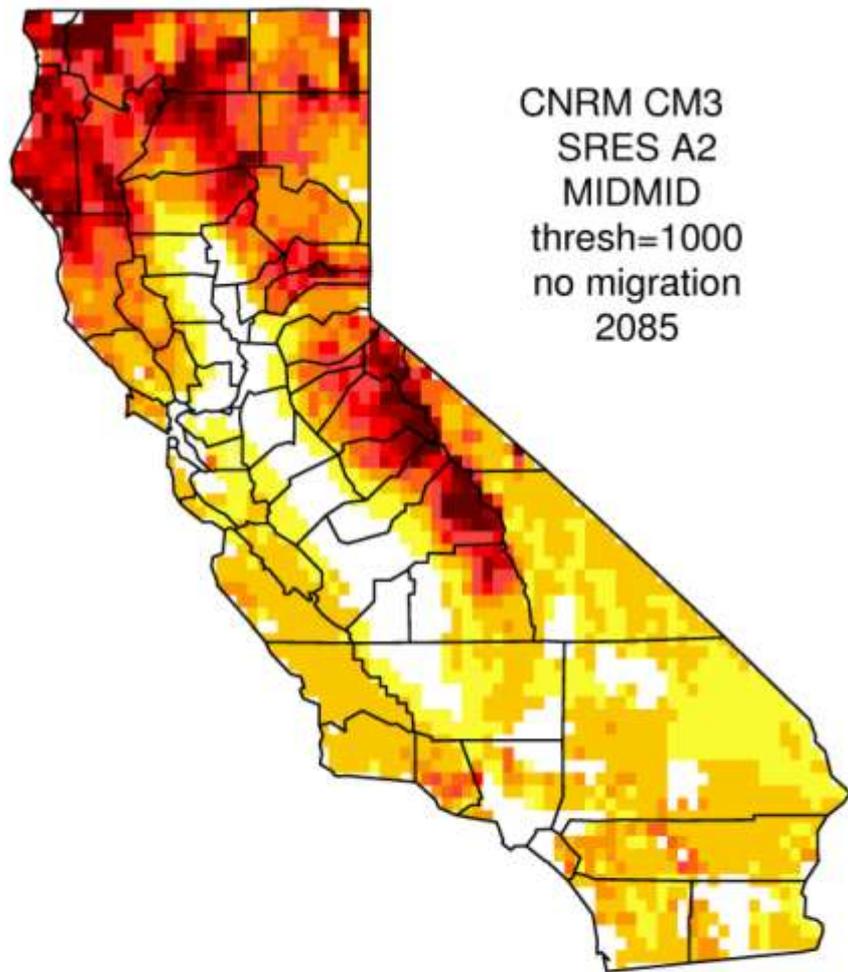


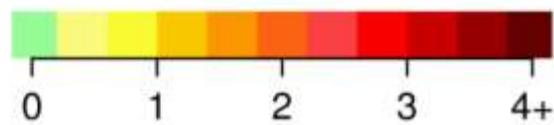
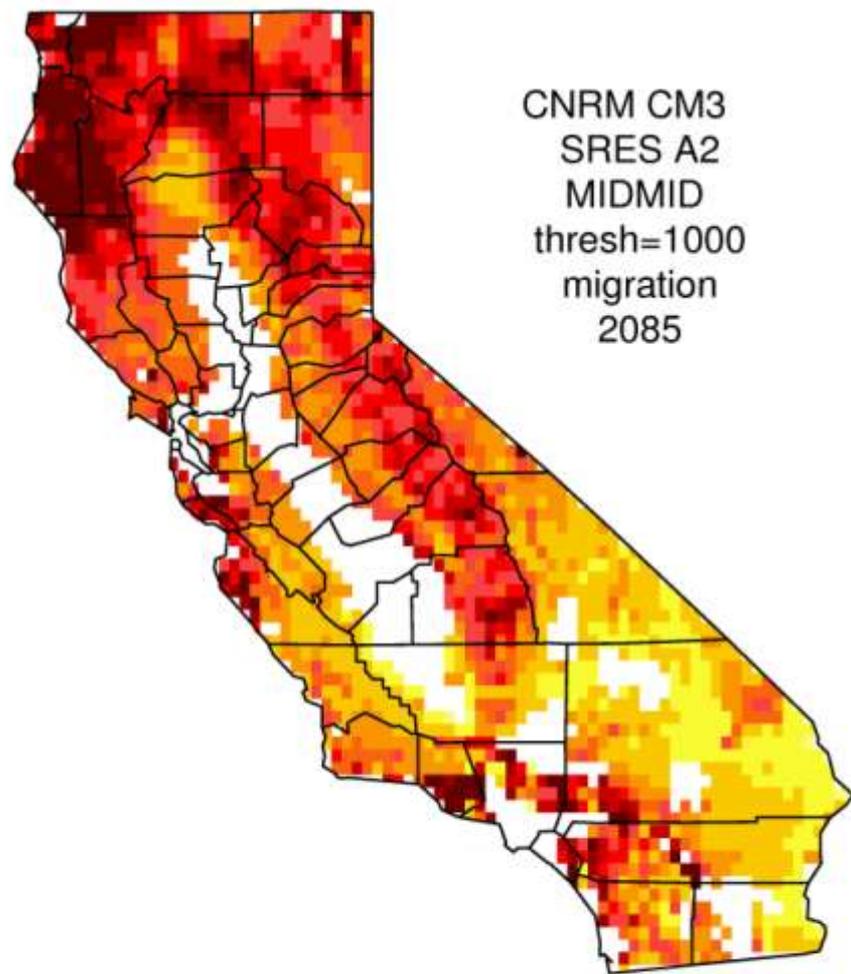
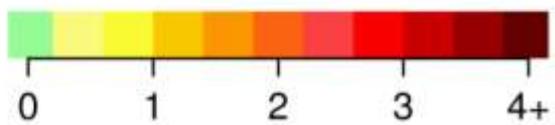
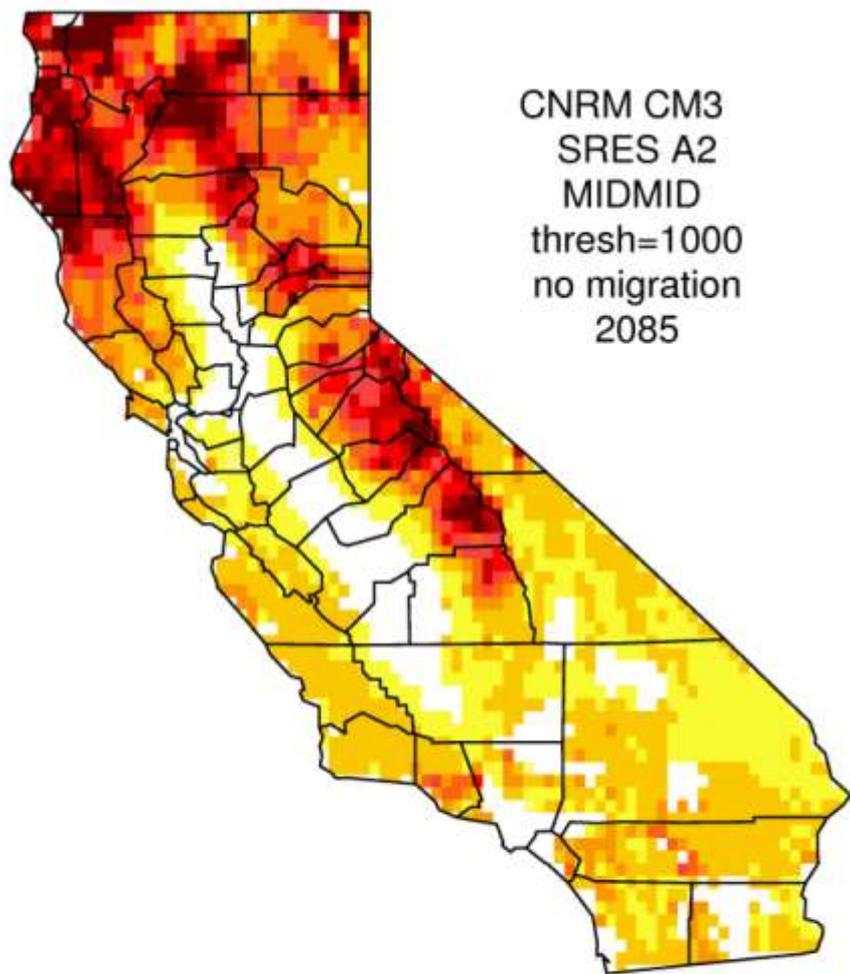
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SRES A2  
MIDMID  
thresh=840  
no migration  
2050

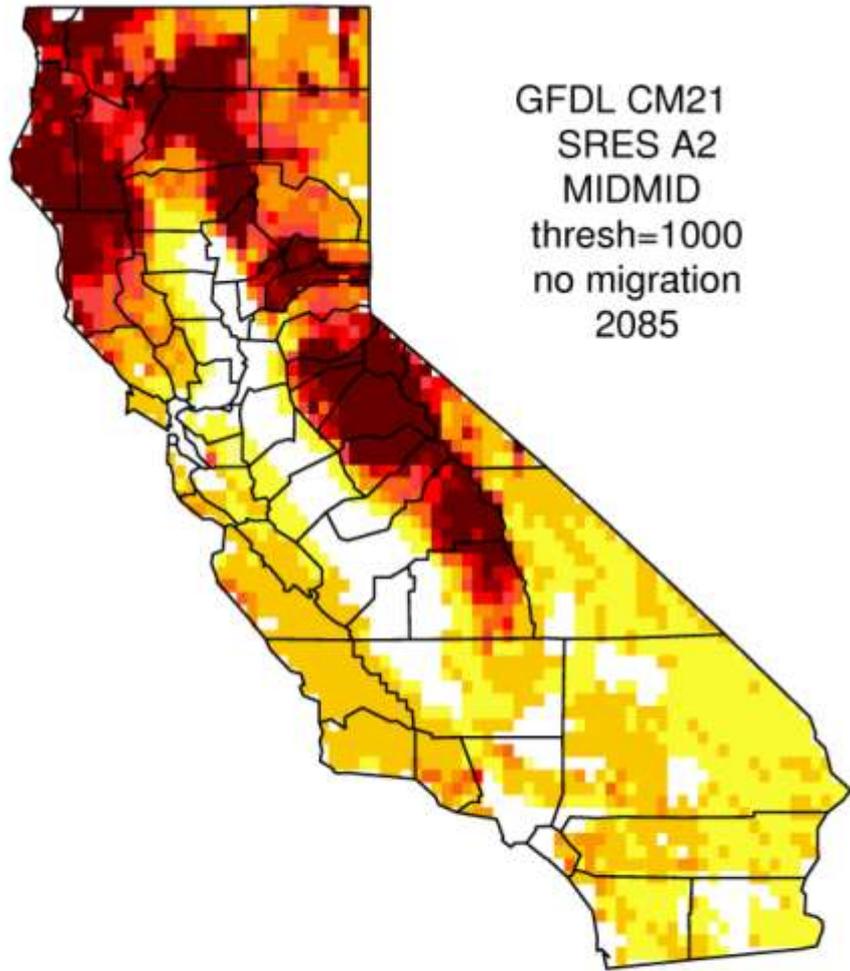


GFDL CM21  
SRES A2  
MIDMID  
thresh=840  
migration  
2050

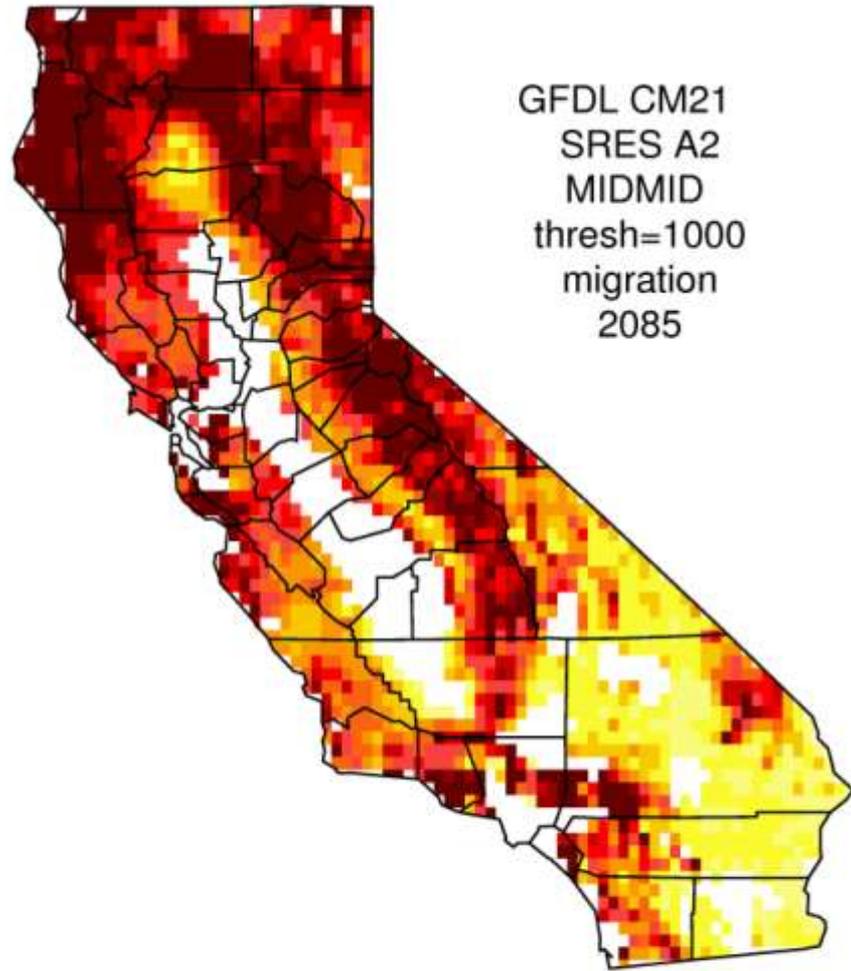
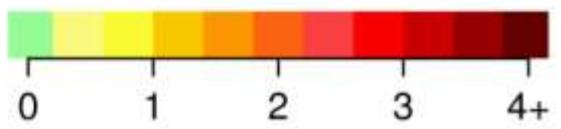




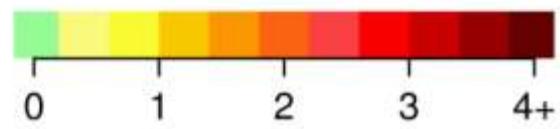




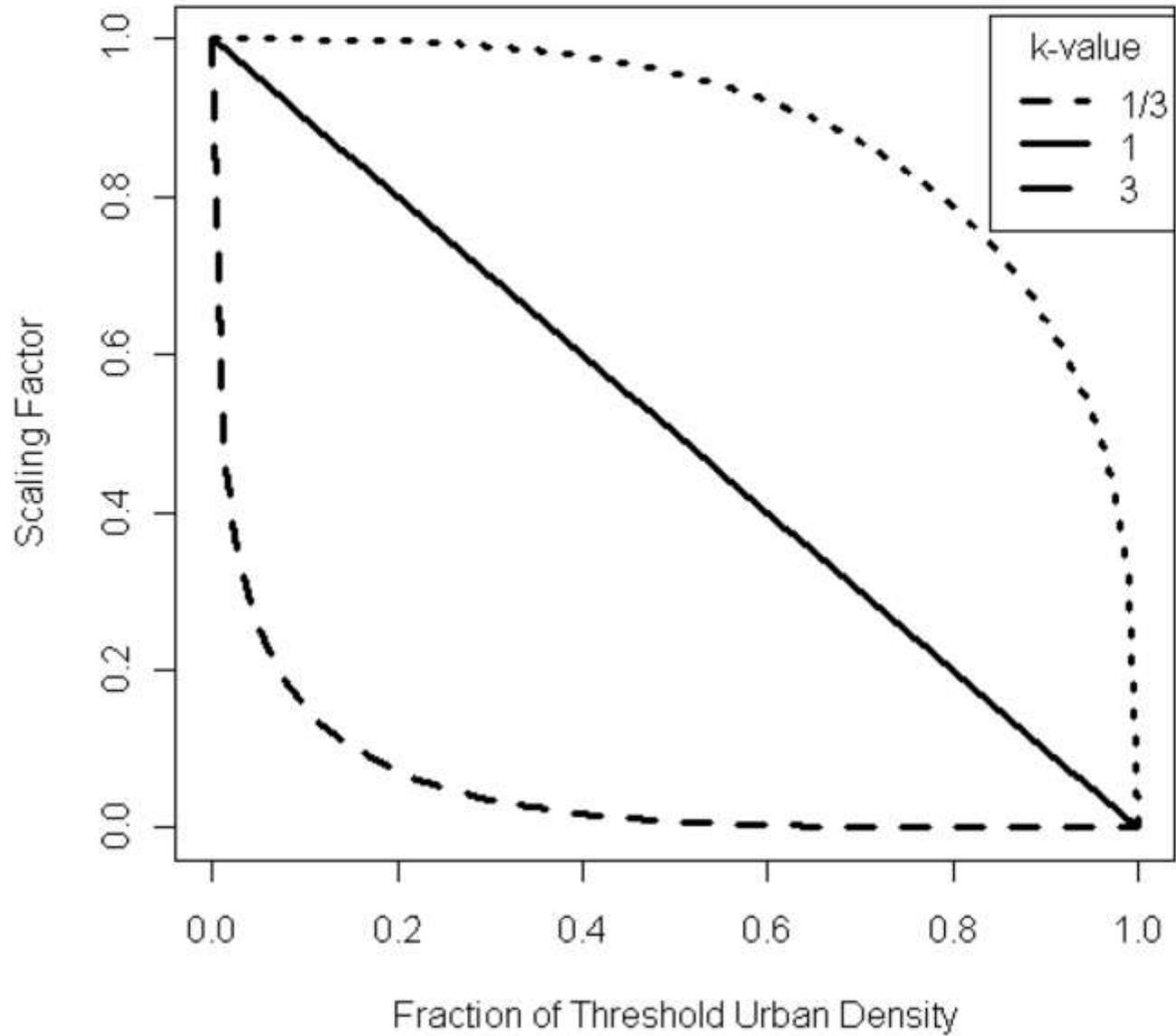
GFDL CM21  
SRES A2  
MIDMID  
thresh=1000  
no migration  
2085



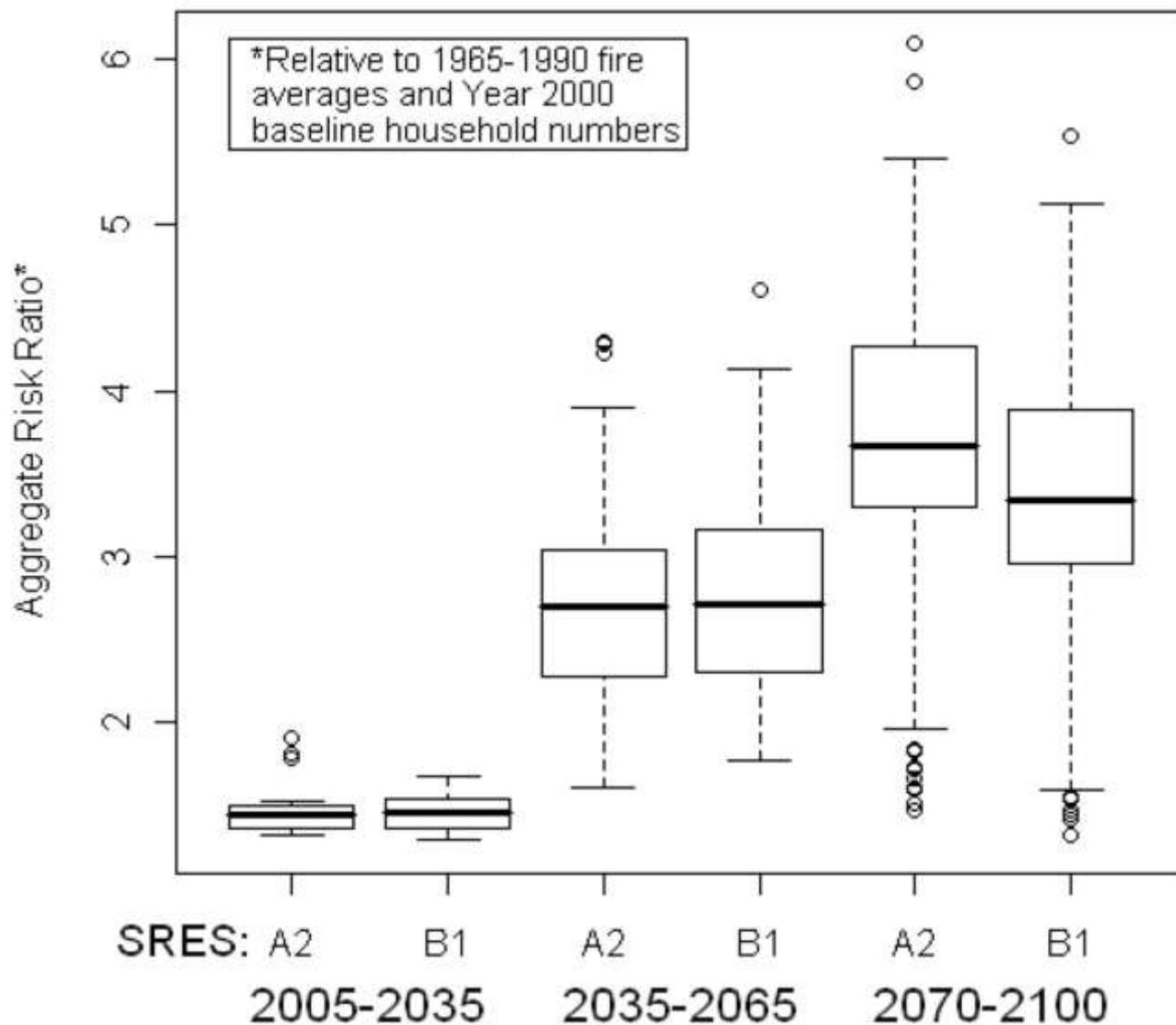
GFDL CM21  
SRES A2  
MIDMID  
thresh=1000  
migration  
2085

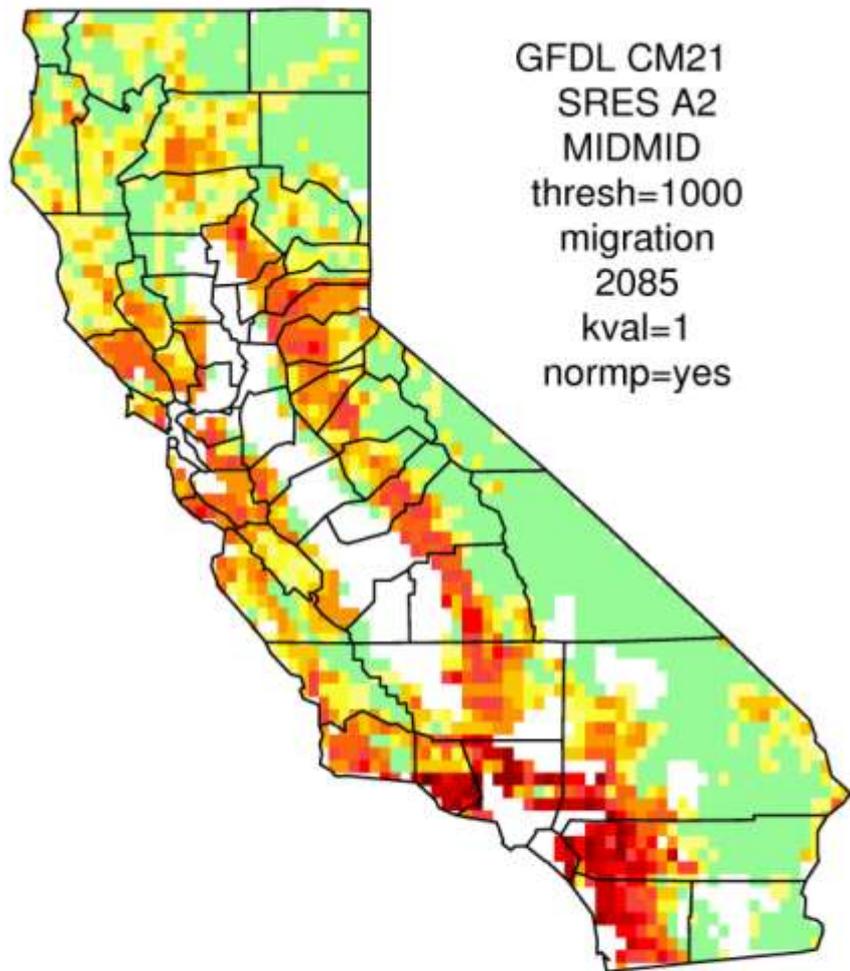


# Risk Exposure Scaling Function



## Changes in Statewide Residential Wildfire Risk





GFDL CM21  
SRES A2  
MIDMID  
thresh=1000  
migration  
2085  
kval=1  
normp=yes

